

# Stink Lake

## Site Description

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### **Location**

Water designation number (WDN)	05-0020-00
Legal description	T117N-R55W-Sec. 1,2,3,11
County (ies)	Codington
Location from nearest town	6.0 miles north and 3.0 miles east of Henry

### **Survey Dates and Sampling Information**

Survey dates	September 17, 2015 (GN)
Gill net sets (n)	3

### **Morphometry**

Watershed area (acres)	42,540
Surface area (acres)	350
Maximum depth (ft)	unknown
Mean depth (ft)	unknown

### **Ownership and Public Access**

Stink Lake is a meandered lake owned by the State of South Dakota and the fishery is managed by the SDGFP. A primitive boat ramp (i.e., constructed using over-sized rock and gravel) located north of 167<sup>th</sup> Street provides public boat access to the lake (Figure 1). Additionally, shore fishing opportunities exist from state-owned lands along the south shore of the lake north of 167<sup>th</sup> Street. Lands adjacent to the lake are owned by the State of South Dakota and private individuals.

### **Watershed and Land Use**

Stink Lake is located within the 42,540 acre Long Lake (HUC-12) watershed. Land use within the watershed is primarily agricultural with a mix of pasture or grassland, cropland, and scattered shelterbelts.

### **Water Level Observations**

Water levels on Stink Lake are not monitored by SDDENR.

### **Fish Management Information**

Primary species	walleye, yellow perch
Other species	black bullhead, green sunfish, orangespotted sunfish, white sucker
Lake-specific regulations	none
Management classification	none
Fish consumption advisories	none

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Figure 1. Map depicting geographic locations of several Codington County lakes including Stink Lake from Henry, South Dakota (top). Also noted is the public access location and standardized net locations for Stink Lake (bottom). STGN= gill nets

## Management Objectives

- 1) Maintain a mean gill net CPUE of stock-length walleye  $\geq 10$ , a PSD of 30-60, and a PSD-P of 5-10.
- 2) Maintain a mean gill net CPUE of stock-length yellow perch  $\geq 30$ , a PSD of 30-60, and a PSD-P of 5-10.

## Results and Discussion

Prior to the 1990's, Stink Lake was a shallow slough with limited sport fishery potential. However, above normal precipitation and the resulting run-off during the mid to late 1990's increased the surface area and depth of the lake. Subsequently, Stink Lake has been capable of sustaining a sport fishery, and is currently managed for walleye and yellow perch.

### *Primary Species*

Walleye: The mean gill net CPUE of stock-length walleye was 2.7 (Table 1) and below the minimum objective ( $\geq 10$  stock-length walleye/net night; Table 3). Since 2004, the mean gill net CPUE has ranged from a low of 2.7 (2015) to a high of 55.7 (2006; Table 2). The 2015 gill net CPUE represented a decrease from the 2011 CPUE of 6.3 (Table 2). Currently, relative abundance is low.

Walleye captured in the 2015 gill net catch ranged in TL from 10 to 28 cm (3.9 to 11.0 in). Length-frequency analysis suggests that two cohorts are present; however, relative abundance appears to be low for both (Figure 2). Few inferences can be made concerning other population parameters (e.g., size structure, condition) due to low sample size.

Yellow Perch: The mean gill net CPUE of stock-length yellow perch was 3.7 (Table 1) and below the minimum objective ( $\geq 30$  stock-length yellow perch/net night). Since 2004, the gill net CPUE of stock-length perch has ranged from a low of 2.3 (2006) to a high of 28.7 (2005; Table 2). Based on the 2014 gill net catch, relative abundance is considered low.

Yellow perch captured in the 2015 gill net catch ranged in total length from 10 to 25 cm (3.9 to 9.8 in). Few inferences can be made concerning size structure or condition due to low sample size.

Other: White suckers were captured in low numbers during the 2015 gill net survey (Table 1).

### **Management Recommendations**

- 1) Conduct fish community surveys utilizing gill nets on an every fourth year basis (next survey scheduled in summer 2019) to monitor fish relative abundance, fish population size structures, fish growth, and stocking success.
- 2) Collect otoliths from walleye and yellow perch to assess age structure and growth rates of each population.
- 3) Stock walleye on a biennial basis ( $\approx 500$  fry/acre) to establish additional year classes.
- 4) Monitor winter and summer kill events. In cases of substantial winter/summer kill stock with walleye and yellow perch to re-establish a fish community.

Table 1. Mean catch rate (CPUE; catch/net night) of stock-length fish, proportional size distribution of quality- (PSD) and preferred-length fish (PSD-P), and mean relative weight (Wr) of stock-length fish for various fish species captured in experimental gill nets from Stink Lake, 2015. Confidence intervals include 80 percent ( $\pm$  CI-80) or 90 percent ( $\pm$  CI-90). WAE= walleye; WHS= white sucker; YEP= yellow perch

Species	Abundance		Stock Density Indices				Condition	
	CPUE	CI-80	PSD	CI-90	PSD-P	CI-90	Wr	CI-90
<i>Gill nets</i>								
WAE	2.7	4.1	0	---	0	---	80	2
WHS	0.7	1.3	100	0	100	0	103	11
YEP	3.7	3.5	73	26	9	16	102	4

Table 2. Historic mean catch rate (CPUE; catch/net night) of stock-length fish for various fish species captured in experimental gill nets from Stink Lake, 2004-2015. BLB= black bullhead; OSF= orangespotted sunfish; WAE= walleye; WHS= white sucker; YEP= yellow perch

Species	CPUE					
	2004	2005	2006 <sup>1</sup>	2007 <sup>1</sup>	2011	2015
<i>Gill Nets</i>						
BLB	10.0	0.3	1.3	0.7	0.0	0.0
OSF <sup>2</sup>	0.3	0.0	0.0	0.0	0.0	0.0
WAE	5.0	7.3	55.7	4.3	6.3	2.7
WHS	0.0	0.0	0.0	0.0	0.0	0.7
YEP	15.7	28.7	2.3	12.7	21.3	3.7

<sup>1</sup>Monofilament gill net mesh size (0.75", 1.00", 1.25", 1.50", 2.00" and 2.50")

<sup>2</sup>All fish sizes

Table 3. Mean catch rate (CPUE; catch/net night) of stock-length fish, proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish, and mean relative weight (Wr) for selected species captured in experimental gill nets from Stink Lake, 2004-2015. WAE = walleye; YEP = yellow perch

Species	2004	2005	2006 <sup>1</sup>	2007 <sup>1</sup>	2011	2015	Objective
<i>Gill nets</i>							
WAE							
CPUE	5	7	56	4	6	3	$\geq 10$
PSD	33	32	5	77	0	0	30-60
PSD-P	0	0	1	31	0	0	5-10
Wr	98	88	91	89	102	80	---
YEP							
CPUE	16	29	2	13	21	4	$\geq 30$
PSD	38	20	100	63	20	73	30-60
PSD-P	17	1	43	0	6	9	5-10
Wr	100	110	110	104	98	102	---

<sup>1</sup>Monofilament gill net mesh size (0.75", 1.00", 1.25", 1.50", 2.00" and 2.50")

Table 4. Stocking history including size and number of fishes stocked into Stink Lake, 2000-2015.

Year	Species	Size	Number
2004	WAE	fry	250,000
2005	WAE	fry	250,000
2010	WAE	fry	250,000
2012	WAE	fry	180,000
2014	WAE	fry	200,000

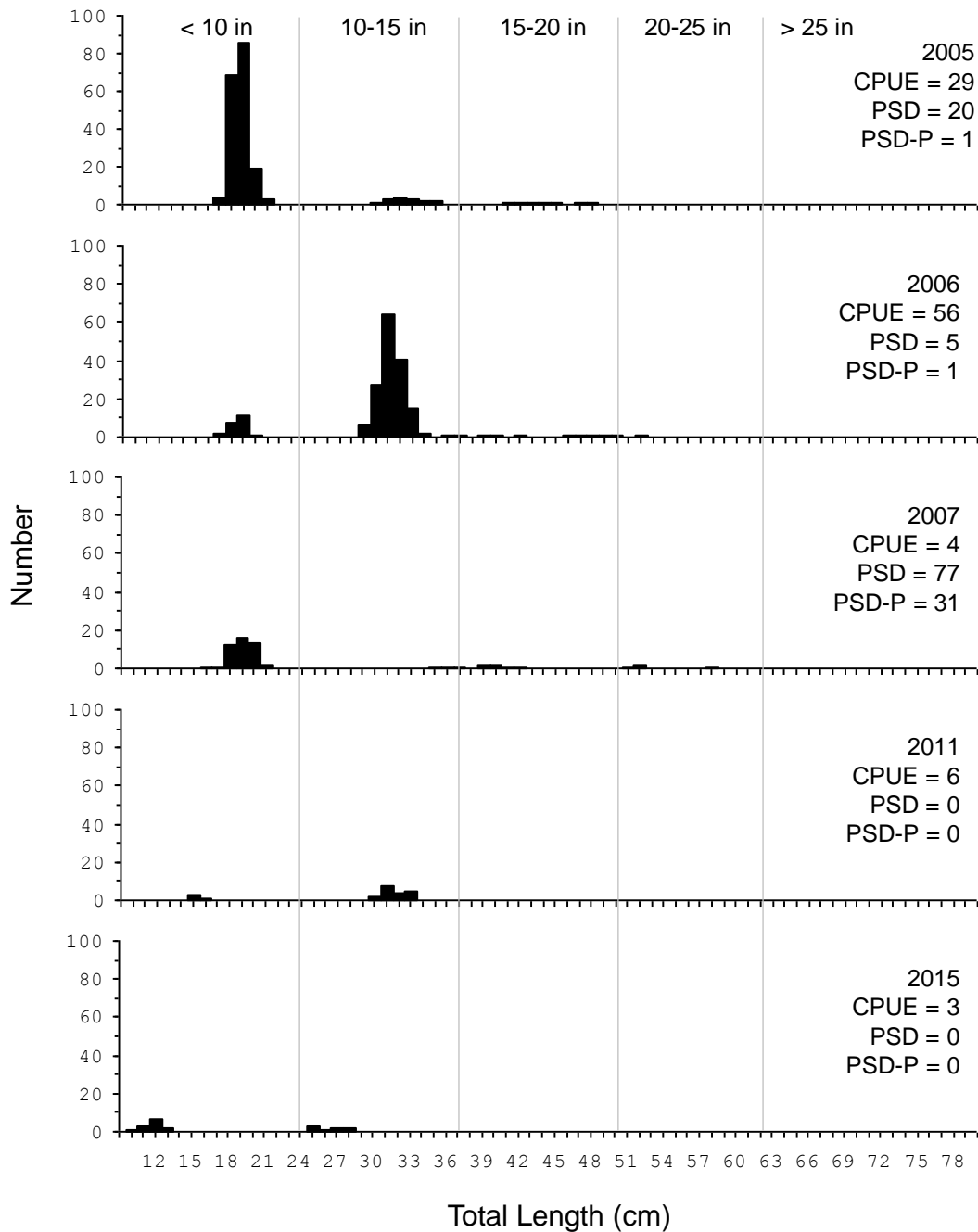


Figure 2. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for walleye captured using experimental gill nets in Stink Lake, 2005-2015.

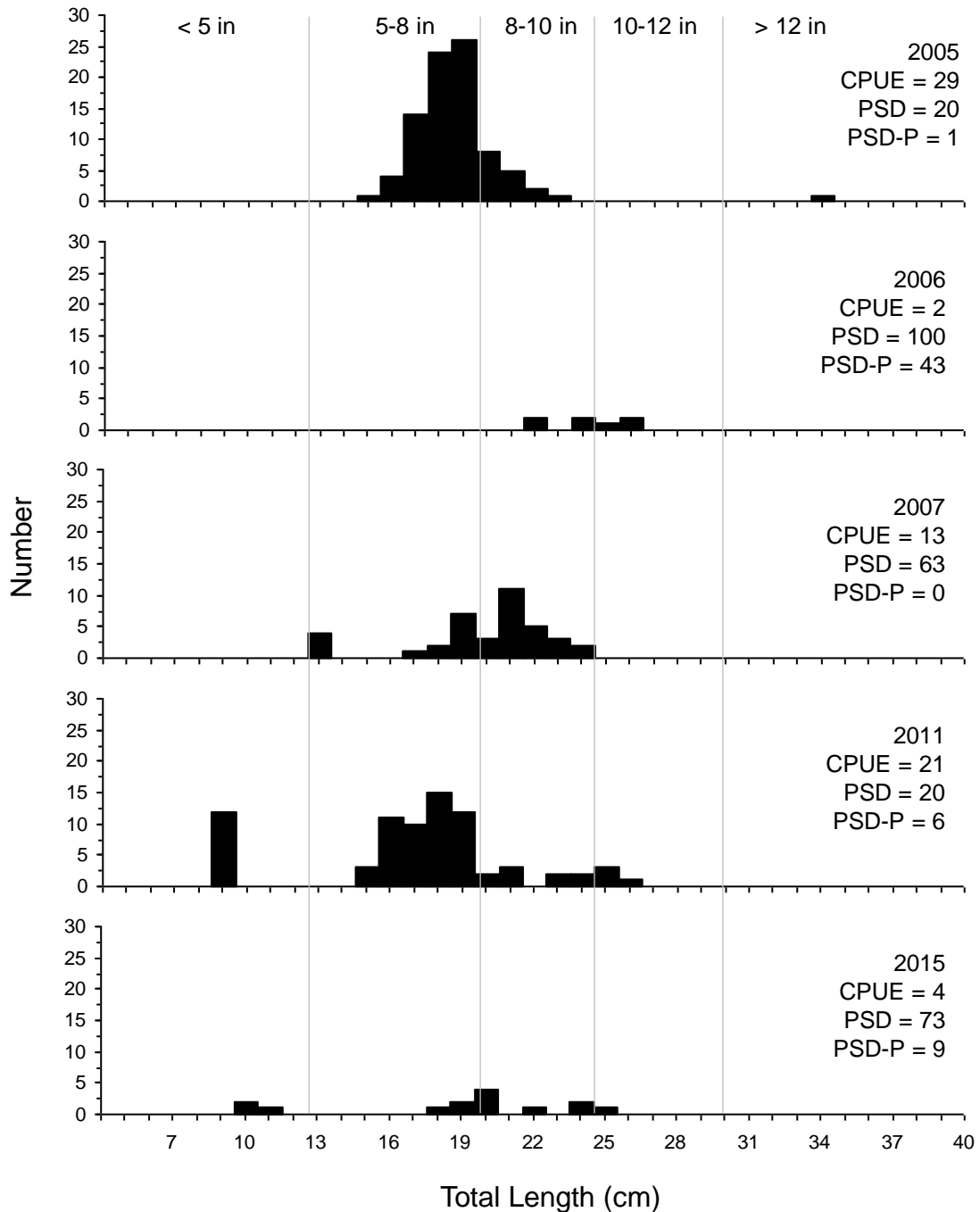


Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for yellow perch captured using experimental gill nets in Stink Lake, 2005-2015.